Case report: The use of elastic separators before proximal infiltration of primary enamel lesions.

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Introduction

The infiltration concept (Icon) is a very effective treatment in preventing further progression of enamel hypomineralisation in small non-cavitated primary carious lesions. The use of elastic orthodontic separators can simplify the treatment procedure by having a better visual control and access to the proximal areas.

Diagnosis

During the yearly check-up in 2018 two bitewing x-rays were made from Kevin's dentition for monitoring purposes. We found an E2 lesion on the distal aspect of tooth 24 and E1 lesion in the mesial aspect of tooth 25. We decided to check the clinical situation more carefully and also discovered enamel demineralisations on the mesial aspect of tooth 26 and on the distal aspect of tooth 25. Lesions seem to be non-cavitated. An appointment for infiltration was made and 4 days in advance the separators were placed intra-orally. (Fig. 1, 2)

Fig. 1: X-ray of the situation in 2018.

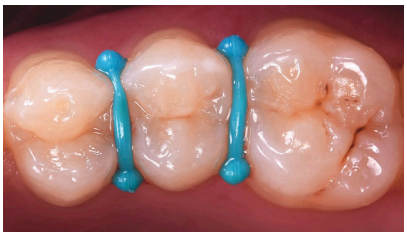

Fig. 2: Intra-oral view with the orthodontic separators in place.

Infiltration

Before cleaning and/or etching a full rubber dam isolation was performed. Initial cleaning was carried out with ultrasonic scalers and diamond coated metal strips. Cleaning the enamel surface is very important in order for the hydrochloric acid to be as effective as possible. Final cleaning is carried out with air polish using sodium bicarbonate. (Fig. 3, 4)

Since the lesions were present on the distal aspect of 24 and the mesial aspect of 25, acid etching was performed without the special perforated foil-tips; likewise for the distal aspect of 25 and the mesial aspect of 26. Etching was applied with a normal metal syringe tip (25ga) and dispersed with non-waxed PFTE floss or with a disposable brush. Activation of hydrochloric acid is important to create better permeability of the enamel for the infiltrant. After etching the enamel was cleaned using ethanol. This cycle was repeated twice before infiltration started. (Fig. 5, 6, 7, 8)

Fig. 3: Situation after rubber dam application; good inversion of the dam is important to prevent contamination of the proximal areas.

The infiltrant was also applied using a normal metal syringe. When using a transparent syringe polymerisation can occur within the syringe between the first and second application of infiltrant; this will obstruct the tip for further use. The infiltrant can be dispersed using non-waxed PFTE floss or a disposable brush. After 10 minutes of infiltration the excess was carefully removed with air and suction. Next, the resin was polymerised for 40 seconds. (Fig. 9, 10, 11, 12)

Fig. 4: Final cleaning with air polishing using sodium bicarbonate.

After polymerisation a second layer of infiltrant was applied. The infiltrant is a non-filled resin (TEGDMA based) and has a high shrinkage rate. A second infiltration for 1 minute will make sure that the surface is sealed properly. After another 40 seconds of light cure the excess was removed. Next the infiltrated areas were finished using polishing strips and silicone points. A final light cure for 20 seconds with glycerine gel was carried out to remove the surface inhibition layer. (Fig. 13, 14, 15, 16)

Evaluation

Three weeks after the infiltration Kevin was rescheduled for an additional oral hygiene appointment. He came back 3 months later for re-evaluation and was monitored closely every 6 months from then on. Since everything looked very stable new bitewing x-rays were only carried out in 2020, two years after the initial treatment. (Fig. 17)

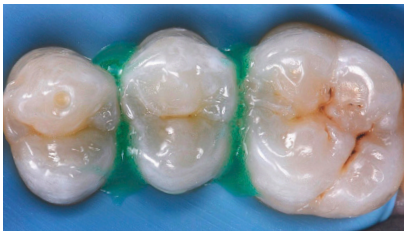

Fig. 5: Etching the hypomineralised areas with hydrochloric acid.

Fig. 6: Situation after thoroughly rinsing with water.

Fig. 7: Applying ethanol to clean the hypomineralised enamel.

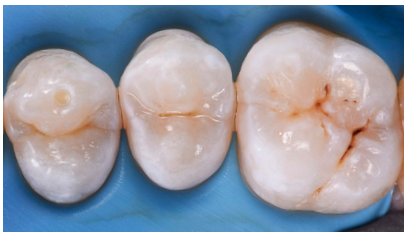

Fig. 8: Situation after 30 seconds; the ethanol is still not evaporated completely, so we wait a little longer.

Fig. 9: Application of the infiltrant.

Fig. 10: Using a disposable brush to divide the infiltrant in the proximal area.

Fig. 11: Using non-waxed PFTE floss to make sure the infiltrant goes everywhere.

Fig. 12: After removing the excess with suction and air, the infiltrant is polymerised for 40 seconds.

Fig. 13: Polishing with a brownie for the first polish.

Fig. 14: Polishing with a greenie for final polish.

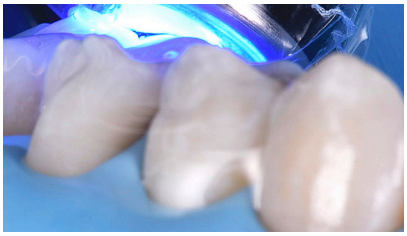

Fig. 15: Final light cure with glycerine gel for 20 seconds.

Fig. 16: Final result after infiltration of 24-25 and 25-26.

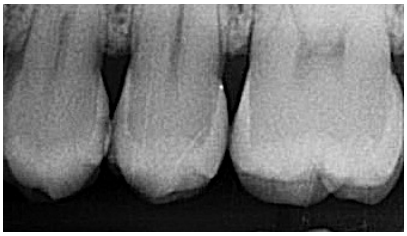

Fig. 17: X-ray of the situation in 2020.

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